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(57) This invention relates to a plastics hinge for plastics containers in which the body and lid are hinged together along common edges.

The invention provides a two-part hinge, one part 7 presenting a rod-like connecting member 11 and the other part 6 providing a pair of parallel, mutually inwardly directed jaw members 14, 15 which are closely spaced to define a longitudinal slot

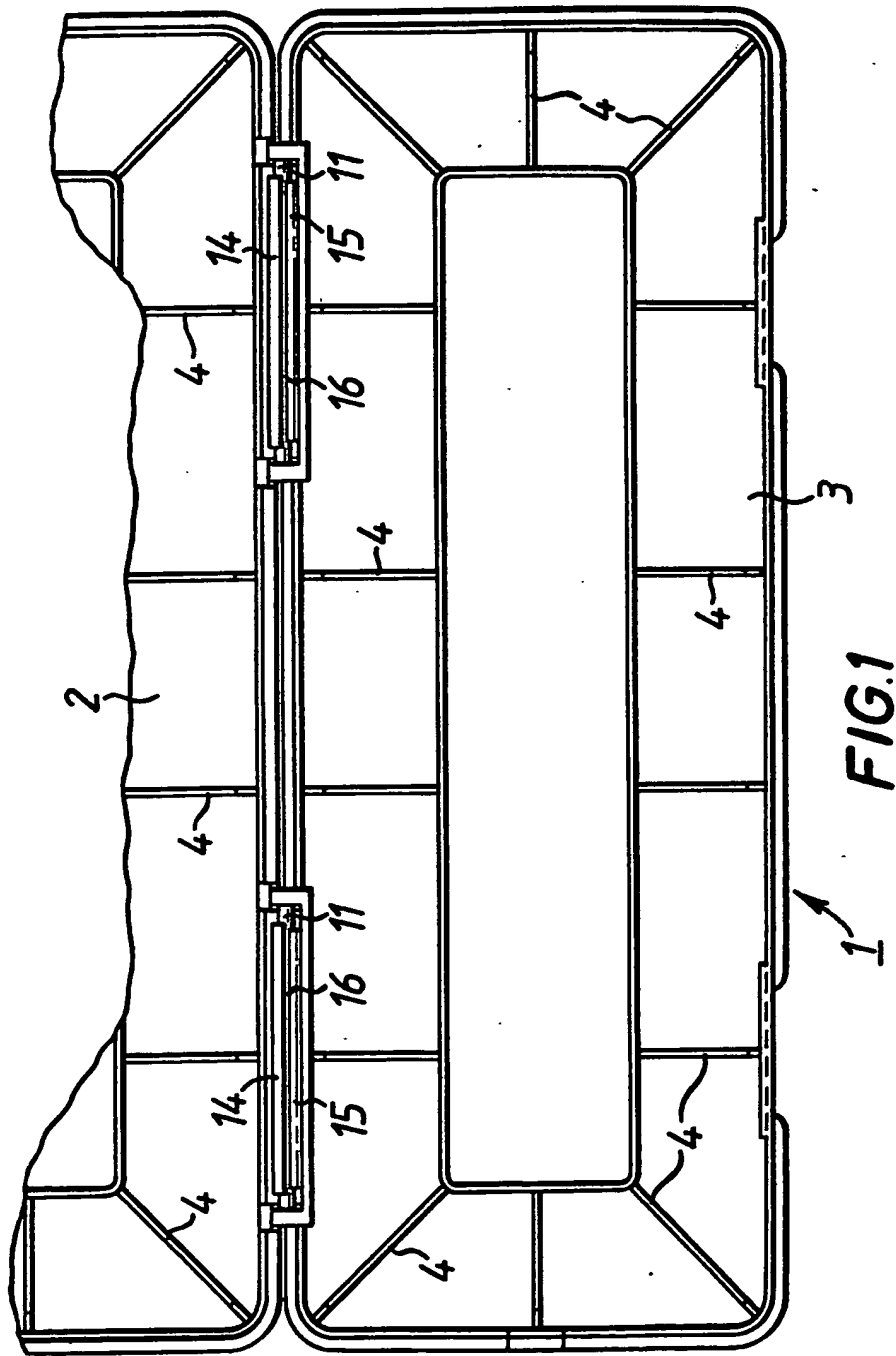
therebetween, and also a spaced pair of bearing support surfaces 17, the arrangement being such that the two hinge parts 6, 7 can be snapped together with the bearing support surfaces 17 bearing against the rod-like member counter to the inner surfaces of the jaw members, to provide a mounting which is axially fixed and readily rotatable.

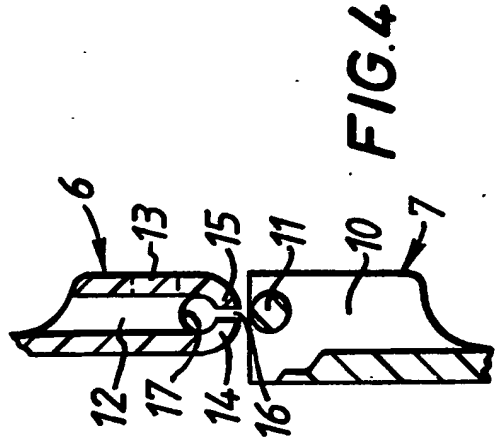
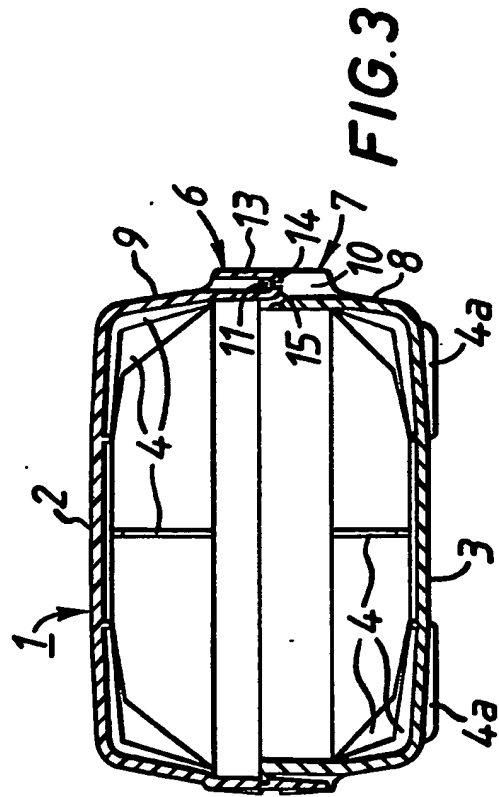
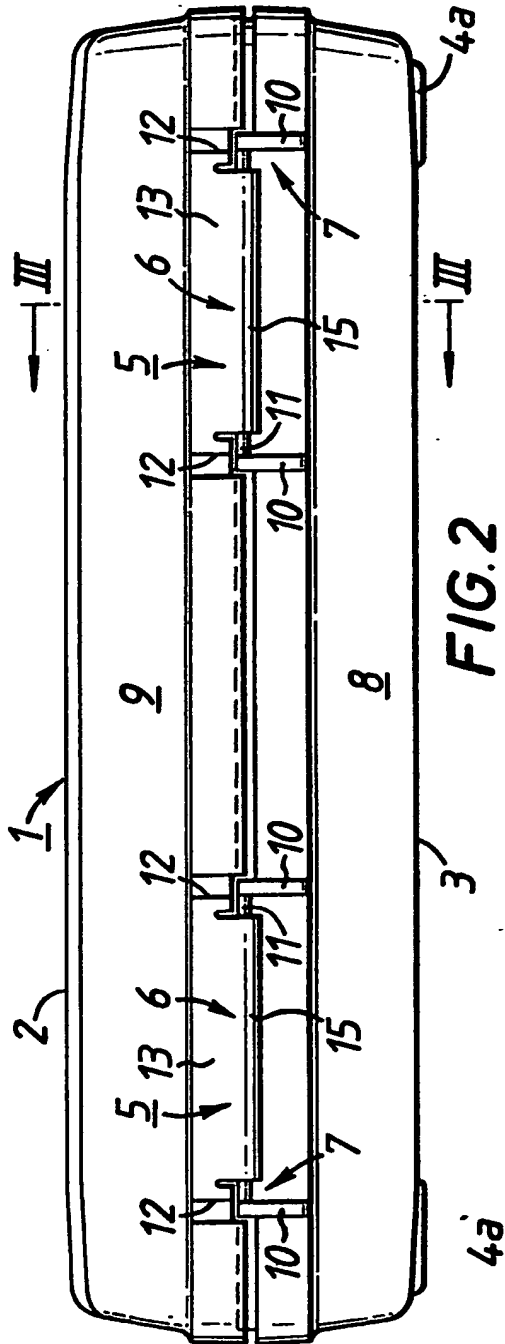
Such an arrangement enables the two hinge parts to be readily formed integrally one with the body and one with the lid of the container.



FIG. 3

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SPECIFICATION

Plastics Hinge Arrangement

This invention relates to plastics hinge arrangements and has particular application to
 5 containers or boxes of plastics material of the kind comprising a body and a lid portion which are hinged together along common edges.

In order to reduce costs and labour to a minimum, it is known to mould the body and lid
 10 portions in a single forming operation, said portions being connected together by one or more relatively thin webs which provide integral hinges for the container. A major disadvantage with such containers is the very limited range of plastics
 15 materials capable of producing an integral hinge flexible and durable enough to withstand repeated opening and closing operations. The most suitable material is polypropylene, but even with this material it is essential to flex the integral hinges
 20 immediately after forming to impart to them the necessary degree of flexibility. If this is not done there is a tendency for the hinges to work harden and split in use. Another disadvantage of polypropylene is that it has a tendency to deform
 25 after forming, due to temperature gradients set up in the material during cooldown, with the result that the wall sections of the container can be somewhat distorted or misshapen.

An object of the present invention is to provide
 30 a plastics hinge arrangement for containers, which can be formed simply in two parts and readily fitted together, thereby enabling the two hinge parts to be formed integrally one with each body and lid portion of the container.

According to one aspect of the invention a plastics hinge arrangement for containers comprises two parts, one part presenting a rod-like connecting member and the other part
 40 providing a pair of parallel, mutually inwardly directed jaw members which are closely spaced to define a longitudinal slot therebetween somewhat narrower than the diameter of the rod-like member of said one part, said other part also providing a spaced pair of bearing support
 45 surfaces shaped and positioned such that, when the two hinge parts are pressed together and the jaw members resiliently move apart to snap over the rod-like member, the bearing support surfaces bear against the rod-like member counter to the
 50 inner surfaces of the jaw members, to provide a mounting which is axially fixed and readily rotatable.

Conveniently, the jaw members are provided by a pair of spaced, parallel wall members and the
 55 two bearing support surfaces are provided one at each end of the wall members; preferably said bearing support surfaces are formed in edges of a pair of end walls supporting the spaced, parallel wall members.

In order to ensure that there is sufficient
 60 resilience for the jaw members to move apart to snap over the rod-like member, at least one of the

wall members may be only partially connected to the end walls.

65 According to another aspect of the invention a container comprising body and lid portions of plastics material includes a hinge arrangement according to the first aspect of the invention, wherein the two parts of the hinge arrangement
 70 are formed integrally with the body and lid portions respectively.

In order that the invention may be readily understood a plastics box incorporating two integral hinges in accordance with the invention
 75 will now be described with reference to the accompanying drawings in which:—

Figure 1 is a fragmentary plan view of the box in its open condition,

Figure 2 is a rear view of the box showing the
 80 two hinges,

Figure 3 is a cross-sectional view of the box, on the line III—III of Figure 2, and

Figure 4 is an enlarged fragmentary section of one of the integral hinges.

85 The plastics box 1 is intended to contain an engineering instrument and is in two halves of similar dimensions comprising a lid portion 2 and a body portion 3. Each portion 2, 3 is moulded from a suitable plastics material, such as ABS or KEMETAL (RTM'S), and incorporate strengthening
 90 ribs 4, to produce a relatively hard and durable product. The body portion can be either moulded to include integral feet 4a, or said feet can be made separately and suitably fixed (e.g. by
 95 adhesive) in position.

In accordance with the invention, the lid and body portions are moulded to include two-part hinge arrangements. Referring particularly to Figures 2, 3 and 4 two hinges are provided each
 100 comprising two moulded hingeparts 6, 7 integrally formed in the rear wall 8, 9 respectively of the lid and body portions. The hinge part 7, which is formed on the body portion 3, comprises a pair of side flanges 10 which support a rod
 105 member 11 at a position adjacent and parallel to the upper edge of the rear wall. The other hinge part 6, formed on the lid portion 2 at a complimentary position, comprises a pair of end walls 12 between which a wall member 13
 110 extends, parallel to the rear wall 9 of said lid portion. The lower regions of the wall member 13 and that part of the rear wall it covers are mutually inwardly directed to provide a pair of jaws 14, 15 defining a longitudinal slot 16
 115 between them, the slot being of a width somewhat narrower than the diameter of the rod member 11. As shown in Figure 2, the end walls 12 are not provided with jaws, but instead they are each provided with a semi-circular bearing
 120 support surface 17 (see Figure 4). Also, as shown in Figure 2, the wall member 13 is connected to its end walls 12 only partially at its upper region, thereby imparting a degree of resilience to the lower region of the wall member 13. Thus, when
 125 the two hinge-parts 6 and 7 are pressed together, the jaw 15 of the hinge part 7 moves away from the jaw 14, due to the resilience in its wall

member 13, to snap over a substantial part of the length of the rod member 11 so as to trap the latter between the curved inner surfaces of said jaws and (at the respective ends of the rod member) the bearing support surfaces 17 of the end walls 12, thereby providing a mounting which is axially fixed, but readily rotatable. Also, it has been found that such a hinge arrangement is durable in use and can continue functioning in a satisfactory manner even if the rod member 11 fractures at any point along its length except perhaps at its end where it is in contact with the bearing support surfaces 17.

The front walls of the lid and body portions 2, 3 are provided with a suitable latching arrangement, such as the resilient tongue and groove arrangement shown most clearly in Figure 3.

It will be appreciated that the actual arrangement and shaping of the hinge parts 6, 7 should be such that they can be readily formed integrally with their respective lid or body portion using a simple mould, if necessary with a suitable soluble core insert.

In the above embodiment, the parts 7 of the two hinges 5 are both mounted on the body portion 3, whilst the parts 6 are mounted on the lid portion 2. However, it will be appreciated that, if the hinge parts of one hinge are reversed with respect to the hinge parts of the other hinge, it is possible to produce the lid and body portions 2, 3 as identical halves from one simple mould.

Summarising, a two-part plastics hinge in accordance with the invention provides the following advantages.

(i) it enables a plastics box to be produced as two-part mouldings, each part integrally incorporating the co-operating parts of the hinge arrangement.

(ii) the moulds for forming the plastics box can be simple and inexpensive, comprising just two mould halves,

(iii) the two halves of the plastics box can be very easily assembled, by snapping the co-operating hinge parts together,

(iv) the two halves of the box can be readily dismantled, perhaps to replace one damaged half, thereby increasing the life of the box relatively simply and cheaply.

(v) life of the hinge arrangement is independent of "Opening" and "Shutting" operations and can be expected to function normally for the whole life of the box,

(vi) the hinge parts can be formed with a generous tolerance in their axial dimensions to

provide a degree of flexibility to accept misalignment adjustment of two box-halves,

(vii) the hinge arrangement has an inherent shock and vibration resistance,

(viii) accidental breakage of the rod member does not necessarily impair the hinge characteristics.

(ix) the hinge characteristics are not affected by environmental high or subzero temperature usage.

(x) the box can be moulded from almost any injection moulding thermoplastics material.

Claims

1. A plastics hinge comprising two parts, one part presenting a rod-like connecting member and the other part providing a pair of parallel, mutually inwardly directed jaw members defining a longitudinal slot therebetween somewhat narrower than the diameter of the rod-like member of said one part, said other part also providing a spaced pair of bearing support surfaces shaped and positioned such that, when the two hinge parts are pressed together, the jaw members resiliently move apart to snap over and be retained on the rod-like member, with the bearing support surfaces bearing against the rod-like member counter to the inner surface of the jaw members, to provide a mounting which is axially fixed and readily rotatable.

2. A plastics hinge according to Claim 1, wherein the jaw members are provided by a pair of spaced, parallel wall members and the two bearing support surfaces are provided one at each end of the wall members.

3. A plastics hinge according to Claim 2, wherein said bearing support surfaces are formed in edges of a pair of end walls supporting the spaced, parallel wall members.

4. A plastics hinge according to Claim 3, wherein at least one of the wall members is only partially connected to the end walls so as to provide sufficient resilience for the jaw members to move apart to snap over said rod-like member.

5. A plastics hinge constructed, arranged and adapted for use substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

6. A container comprising a body and lid of plastics material which are hinged together by a plastics hinge according to any one of the preceding claims, the two parts of said plastics hinge being formed integrally one with the body and one with the lid at co-operating positions.